Use Staples as Breadboard Jumpers

Written By: Sean Michael Ragan

TOOLS:

- Acetone (100 mL)
- Erlenmeyer flask (1)
  or other glass vessel for soaking staples
- Erlenmeyer flask (1)
  or other glass vessel for filtration
- Funnel (1)
- Paper Towel (1)

PARTS:

- MAKE Mintronics Survival Pack (1)
- Staples (1 strip)
  You should also experiment with other sizes.

SUMMARY

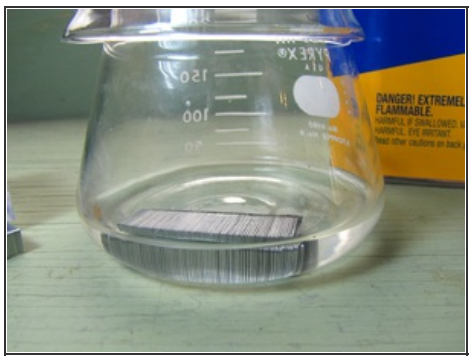
Recently, we've been brainstorming ideas for a breadboarding workshop to put on at Maker Faire and other events. Hoping to save participants the tedium of cutting and stripping their own jumper wires (and the cost of providing readymade jumpers) we hit on the idea of using staples. I first read about this hack on Instructables, awhile back, and was excited to find a chance to put it to use.

Just one problem: it doesn't work.

Or, I should say, it *didn't* work. At first. Our prototype staple-wired circuit was DOA, and putting a multimeter across one of the staples quickly revealed why. Staples are glued together, at the factory, to make strips, and the glue insulates the metal and keeps them from making solid electrical contact with the breadboard tie points. We tried several staple types and brands and had the same problem with each.

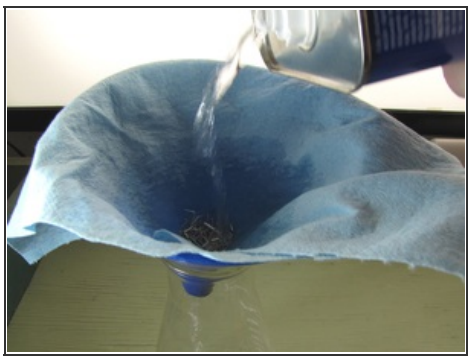
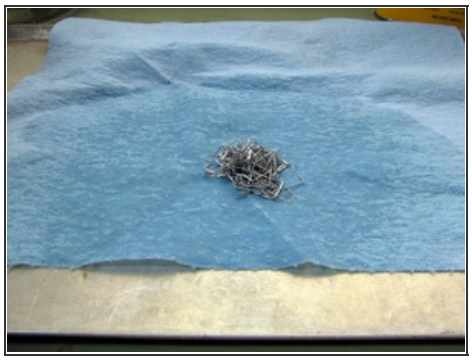
It was Michael Castor who hit on the idea of pre-soaking the staples in acetone, which works great. This treatment not only removes the glue, but causes the strips to fall apart into pristine individual staples. This was an unexpected benefit, as we were expecting to have to keep staplers around so workshop participants could punch out their jumpers one at a time. Now we can just provide bowls full of acetone-washed staples at every station.

Step 1 — Soak the staples in acetone.



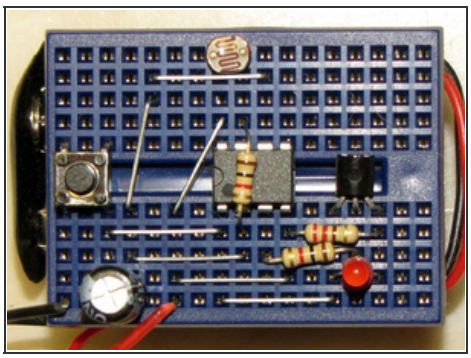
- Drop a couple of strips of staples into a liquid-tight glass, ceramic, or metal container. Have a glass, ceramic, or metal cover handy to keep the solvent from evaporating away during the soak.
- Pour acetone into the container until the strips are just covered. Put the cover on the container, and let it stand for awhile.
- After about twenty minutes, remove the cover and swirl the contents of the container. When the coating is fully dissolved, the stick of staples will simply fall apart into a mass of pristine individual staples.

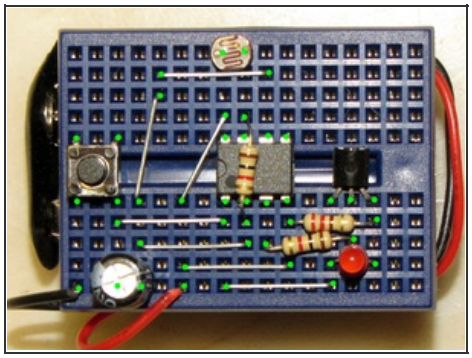
Step 2 — Rinse and dry.

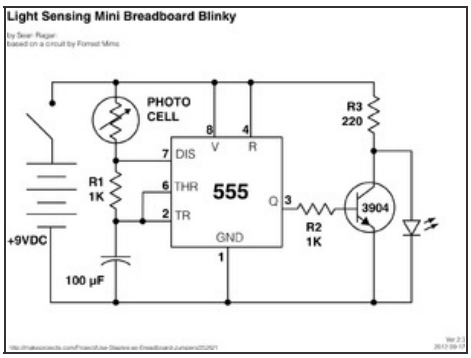




- Once the strips fall apart, set up a separate glass or metal container for simple filtration. Set an oil funnel in the mouth of the container, line it with a paper towel, and pour the staples, solvent and all, into the funnel.
- Once the acetone has run through the filter, pour a little more fresh acetone over the mass of staples to wash off any remaining residue from the coating.
- Leave the staples on the filter to air dry, for a few minutes, then lift the paper towel out of the funnel and spread it on a solvent-proof surface. Spread out the mass of staples, on the paper towel, and let them thoroughly air-dry.

Step 3 — Use normally.







- Staples come in many shapes and sizes! If you're in the USA, the most common office staple size has a 1/2" "crown" and 1/4" legs. These make a nice substitute for 0.5" breadboard jumpers (the "green" size, in most jumper kits), which span 6 holes on a standard 0.1" breadboard grid.
- "Heavy-duty" staples are made from thicker gauge wire and may work better if your breadboard has loose tie points. Staples also come in many other crown sizes. Experiment with these to build yourself a whole staple-based jumper kit!
- Staples are incredibly cheap compared to readymade breadboard jumpers. The only major downside, at least on a prototype timescale, is that they are not insulated along the crown, so you can't overlap them without risking a short. Also, you'll need to be more careful about touching the breadboard with metal objects .

Shown here is a simple 555-based photodetector based on a Forrest Mims design. The more light on the photoresistor, the faster the LED flashes. The circuit diagram is also attached to this project as a PDF.

This document was last generated on 2012-10-31 01:57:44 AM.